North Carolina Department of Environment and Natural Resources

Pat McCrory
Governor

Donald R. van der Vaart
Secretary

June 5, 2015

MEMORANDUM

To: Linda Culpepper, Director
Division of Waste Management

From: Jason M. Watkins, Field Operations Branch Head
Division of Waste Management
Solid Waste Section

Subject: Hearing Officer's Report and Recommendations
Green Meadow, LLC and Charah, Inc. Proposed Coal Ash Reuse Projects
Division of Waste Management's Draft Structural Fill Permits
Chatham and Lee Counties

I served as the Hearing Officer for the Subject Public Hearings held at the Dennis A. Wicker Civic Center in Sanford, NC on April 13, 2015 and at the Chatham County Courthouse in Pittsboro, NC on April 16, 2015. The public hearings were held under the authority of the Coal Ash Management Act of 2014, the Mining Act of 1971 and Title 15A of the North Carolina Administrative Code Chapter 02H.0504. The combined public hearings were held to receive comment for the Division of Water Resources' 401 water quality certification, the Division of Energy, Mineral and Land Resources' draft modified mining permits and the Division of Waste Management's draft structural fill permits requested by Green Meadows, LLC and Charah, Inc. in order to reuse coal ash at the Colon Mine Site in Lee County and the Brickhaven No. 2 Mine Tract "A" in Chatham County.

In addition to listening to oral comments at the public hearings, I have reviewed all written comments received during the public comment period. In preparation of this report I have considered all of the public comments, the public record, and discussions with Division staff.

The report has been prepared using the following outline:

I. Site History / Background
II. April 13, 2015 Public Hearing Summary
III. April 16, 2015 Public Hearing Summary
IV. Comments and Response
V. Recommendations
VI. Summary
VII. Attachments

I. History / Background

In February 2014, a failure in a portion of the stormwater conduit under the primary ash basin at the Dan River Steam Station resulted in the release of a large volume of coal ash residuals into the Dan River. The spill brought in local, state and national attention to the management of coal ash.

Shortly after the spill, Governor Pat McCrory proposed a comprehensive coal ash action plan in April 2014. The North Carolina General Assembly passed Session Law 2014-122 based on the Governor's Coal Ash Action Plan, known as the Coal Ash Management Act (CAMA), which became effective on September 20, 2014. This legislation requires the cleanup of coal ash and closure of coal ash ponds at all 14 coal ash sites and gives oversight to the Department of Environment and Natural Resources (DENR). The law also set hard deadlines to end wet coal ash production in North Carolina and imposes new, protective requirements on large projects using coal ash as fill material. The law includes new requirements regarding public notification of spills, providing drinking water to affected families, and monitoring of groundwater around the ash ponds.

As part of CAMA, NCGS 130A-309.218 – 130A-309.226 provides the provisions for comprehensive management of coal combustion residuals and provides for the permitting, construction, operation and closure of structural fills in open pit mines.

In Nov. 2014, Green Meadow, LLC and Charah, Inc. submitted applications for mining permit modifications and structural fill reuse permits to the Division of Energy, Mineral and Land Resources (DEMLR) and the Division of Waste Management (DWM) as allowed under CAMA. On Jan. 23, 2015, the state approved a request to transfer mining permit #53-05 for the Colon Mine in Lee County and permit #19-25 for the Brickhaven #2 Tract A in Chatham County to Green Meadow, LLC.

These two projects must also obtain 401 Water Quality Certifications from the Division of Water Resources (DWR).

The following is a brief summary of each of the proposed project locations and the permits under review:

Colon Mine - Mining Permit #53-05

On Oct. 3, 1972, the state granted Sanford Brick and Tile Co. a permit to conduct mining activities at the Colon mine site located in Lee County, five miles southeast of the City of Sanford, off Brickyard Road. The mining permit was renewed on Oct. 12, 1982. Between November 1988 and December 2014, Cherokee Sanford Group Inc. renewed mining permit #53-05 three times, in adherence with the standard 10-year mining permit renewal cycle. The company also requested and was granted permission to modify mining permit #53-05 eight times during this same time period.

The currently proposed modifications would include redesigning the erosion and sedimentation control measures throughout the site and reducing the affected acreage to 314 acres. The modification also includes changing the method for reclaiming the mine by constructing a structural fill using coal combustion products in accordance with the provisions of the CAMA. Reclamation of the mine site using a structural fill requires a separate permit from the mining permit, the DWM Draft Permit #5306-STRUCT-2015.

Brickhaven No. 2 Mine Tract "A" Permit #19-25
On Aug. 30, 1985 the state granted Cherokee Brick Co. a permit to conduct mining activities at the Brickhaven No. 2 Mine Tract "A" site located in Chatham County, six miles south of Moncure. Between August 1985 and October 2014, Cherokee Sanford Group Inc. renewed mining permit #19-25 two times, in adherence with the standard 10-year mining permit renewal cycle. The company also requested and was granted permission to modify mining permit #19-25 eight times during this same time period.

The currently proposed modifications would include redesigning the erosion and sedimentation control measures throughout the site and reducing the affected acreage to 267 acres. The modification also includes changing the method for reclaiming the mine by constructing a structural fill using coal combustion products in accordance with the provisions of the CAMA. Reclamation of the mine site using a structural fill requires a separate permit from the mining permit, the DWM Draft Permit #1910-STRUCT-2015.

As part of the permit review process, staff from the DEMLR and the DWM visited the Colon Mine site on December 5, 2014. DEMLR staff also conducted an inspection of the Brickhaven site on November 9, 2014.

Under the authority of CAMA, the Mining Act of 1971 and Title 15A of the North Carolina Administrative Code Chapter 02H .0504, the department established a public comment period on the draft permits, including two public hearings.

II. April 13, 2015 Public Hearing

A public hearing was held on April 13, 2015 at 6:00 p.m. in the Dennis A. Wicker Civic Center in Sanford, NC. The public hearing was held under the authority of CAMA, the Mining Act of 1971 and Title 15A of the North Carolina Administrative Code Chapter 02H .0504. This was a combined public hearing to receive comments about the Division of Water Resources' 401 water quality certification, the Division of Energy, Mineral and Land Resources' draft modified mining permits and the Division of Waste Management's draft structural fill permits (Attachment I) requested by Green Meadows, LLC and Charah, Inc. in order to reuse coal ash at the Colon Mine Site in Lee County and the Brickhaven No. 2 Mine Tract "A" in Chatham County.

Note that the draft permit was available for public review (Attachment II) and was posted on the DENR website on March 23, 2015, which started the public comment period. Additionally, notice was published in the Chatham News and the Sanford Herald on March 26, 2015. The public comment period ended on May 16, 2015.

Approximately 134 people attended the public hearing, including 24 staff members from DENR. A total of 110 individuals signed the attendance sign-in sheets at the hearing (Attachment IV). The Hearing Officer provided opening comments before opening the hearing for public comment. Thirty-two (32) individuals registered before the start of the hearing to make comments and eight (8) additional individuals made comments, for a total of 40 speakers. Speakers were given three minutes for initial presentations and additional time was provided after everyone that registered to speak had spoken.

The list of speakers is included as Attachment VI. Of the 40 individuals who spoke at the public hearing, none were in favor of the draft permits being approved.

The public hearing transcript, including oral comments, is attached as Attachment VIII. DWM also received approximately 100 written comments during the public comment period from local and state government agencies, citizens and citizen groups (Attachment X). Several of the comments consisted of written transcripts of the comments providing during the public hearings. A summary of the comments for both hearings and the comment period are included in Part V below.

III. April 16, 2015 Public Hearing

A second public hearing was held on April 16, 2015 at 6:00 p.m. in the Chatham County Courthouse in Pittsboro, NC. The public hearing was held under the authority of CAMA, the Mining Act of 1971 and Title 15A of the North Carolina Administrative Code Chapter 02H .0504. This was a combined public hearing to receive comments for the Division of Water Resources' 401 water quality certification, the Division of Energy, Mineral and Land Resources' draft modified mining permits and the Division of Waste Management's draft structural fill permits (Attachment I) needed by Green Meadows, LLC and Charah, Inc. in order to reuse coal ash at the Colon Mine Site in Lee County and the Brickhaven No. 2 Mine Tract "A" in Chatham County.

Note that the draft permit was available for public review (Attachment III) and was posted on the DENR website on March 23, 2015, which started the public comment period. Additionally, notice was published in the Chatham News and the Sanford Herald on March 26, 2015. The public comment period ended on May 16, 2015.

Approximately 137 people attended the public hearing, including 17 staff members from DENR. A total of 120 individuals signed the attendance sign-in sheets at the hearing (Attachment V). The Hearing Officer provided opening comments before opening the hearing for public comment. Thirty-seven (37) individuals registered before the hearing to make comments and four (4) additional individuals made comments, for a total of 41 speakers. Speakers were given three minutes for initial presentations and an additional time of two minutes was provided after everyone that registered to speak had spoken. One speaker left the hearing prior to being recognized and five (5) speakers took the opportunity to comment a second time. The list of speakers is included as Attachment VII. Of the 40 individuals who spoke at the public hearing, none were in favor of the draft permits being approved.

The public hearing transcript including oral comments is included as Attachment IX. In addition to the public hearings, DWM received approximately 100 written comments during the public comment period from local and state government agencies, citizens and citizen groups (Attachment X). Several of the comments consisted of written transcripts of the comments providing during the public hearings. A summary of the comments for both hearings and the comment period are included in Part V below.

IV. Comments and Response

The following is a review of the comments received during the April 13 and April 16 public hearings, emails and other written comments received by the Division of Waste Management. Consistent within the comments was opposition to the approval of these permits based on a varying set of criteria.

Through my review of the application documents, the submitted comments and discussion with division staff, responses are provided relevant to the permit conditions and/or the application process.

1. **Broad Coal Ash Management**

   Multiple comments were received which were directed at the general or broad management of coal ash. Commenters were particularly concerned about why the ash was not being managed on the property where it was generated, the availability of alternative technology (solidification, etc.), whether reuse of ash was being adequately explored, and whether the current process was only providing a short-term solution that would lead to longer-term issues for the next generation.

2. **Quality of Life Concerns**

   The majority of comments at the hearings and in writing were directly related to concerns over the quality of life of the citizens of Lee and Chatham counties that live in close proximity to the proposed structural fill sites. Of particular concern was increased truck and rail traffic due to the project size, in many cases where the commenters noted overcrowded roads and proximity to areas like schools, daycare, etc. Other issues such as dust (both from vehicles and site operations), ground and surface water contamination, loss of property values, and a perceived targeting of a poor, rural community were also raised repeatedly.

3. **General Statements on Government**

   Numerous comments were directed at the various government entities involved in the process' including concerns over the NC Legislature and provisions in the CAMA blocking local government approval of these sites, concerns that the local governments were not fighting back for their citizens, and a distrust in DENR and its ability to permit and ensure compliance of these sites due to staffing levels and outside influence. Other general government-related statements involved things such as the need for more renewable energy, forcing Duke Energy to cease using coal, and who should pay for Duke Energy's past mismanagement of coal ash.

4. **Permitting Process**

   Due to the number of public comments, many of which expressed concerns on the same issues, I have not addressed each comment individually. Comments specific to the permit review process are grouped by issue below with a detailed response for each:

- There were multiple comments received at the hearings and in written form voicing concerns about why DENR was permitting the movement of ash from the Duke Energy facilities, where it was produced, to Lee and Chatham Counties.

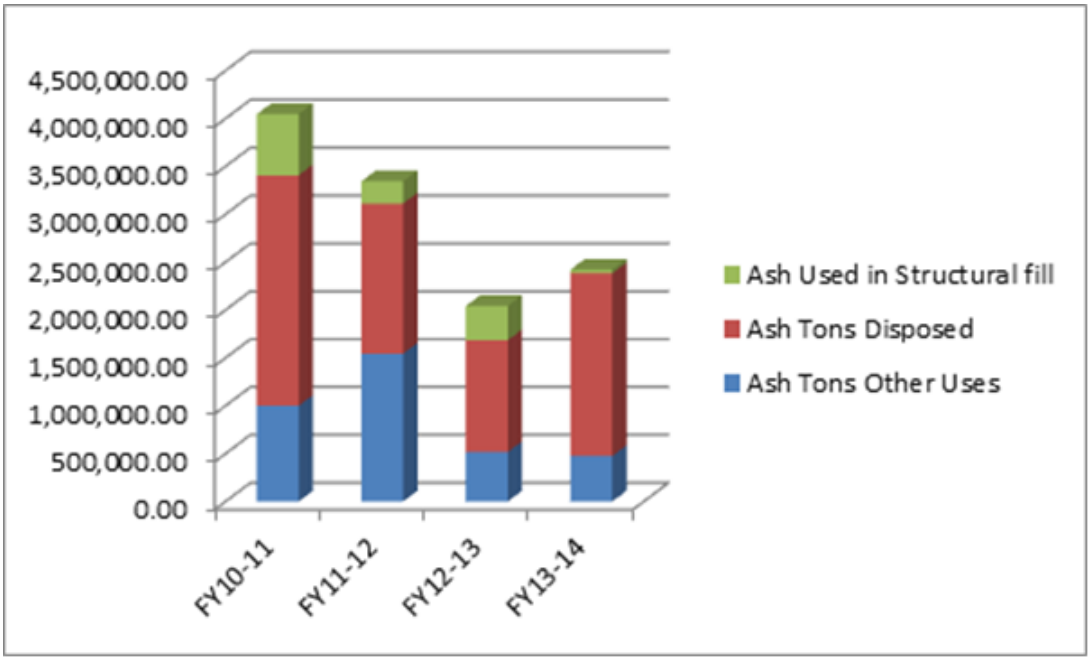
  Senate Bill 729/Session Law 2014-122 entitled "CAMA of 2014" was ratified by the General Assembly of North Carolina and became Law on September 20, 2014. The Law has been codified in North Carolina General Statutes (NCGS) 130A-309.200 through 130A-309.226 "Coal Ash Management". The CAMA provides the provisions for comprehensive management of coal combustion residuals and provides for the permitting, construction, operation and closure of

structural fills in open pit mines. DENR has received and reviewed the applications and documentation provided by Green Meadow, LLC and Charah, Inc. for the Brickhaven No. 2 Tract "A" Mine Structural Fill and the Colon Mine Site Structural Fill, and has determined that the applications and documentation meet the requirements of CAMA, as conditioned in the draft permits.

- There were multiple comments received at the hearings and in written form voicing concerns that the permit review process was being rushed without considerations given to on-site management, alternative technologies, etc.

  The CAMA of 2014 was ratified by the General Assembly of North Carolina and became law on Sept. 20, 2014. The law provided a schedule for the closure of ash basins across North Carolina, specifically requiring that four high priority sites be closed by 2019. The permits currently under review are a step towards closure of and removal of ash from two ash basin facilities. The permit review process and timeframes associated with each step in the process are detailed in the law. The agency, along with the Department of Transportation, as well as universities and private companies, continue to explore alternative technologies and other management options.

  Note: Based on information tracked by the DWM Solid Waste Section (Section), the following depicts the current disposal and reuse of coal ash occurring in North Carolina:



- There were multiple comments received at the hearings and in written form addressing DENR's ability to permit these sites due to enforcement and litigation actions involving Duke Energy.

  The permit applicant is Green Meadows LLC as owner and Charah, Inc. as operator. Duke Energy is not a permit applicant. In addition, current structural fill permit regulations do not include evaluation of an applicant's compliance history.

- There were multiple comments received at the hearings and in the written form voicing concerns related to Green Meadows, LLC and Charah, Inc.'s ability to address future financial and environmental liability of the management of coal ash at these two sites. Commenters stated that the $2 million coverage for future contamination issues was not enough to cover the true costs.

  Pursuant to North Carolina General Statute (NCGS) 130A-309.219(a), for projects involving placement of 8,000 or more tons of coal combustion products per acre; or 80,000 or more tons of coal combustion products in total per project, the applicant for a permit or a permit holder to construct or operate a structural fill shall establish financial assurance that will ensure that sufficient funds are available for facility closure, post-closure, maintenance and monitoring, any corrective action that the Department may require, and to satisfy any potential liability for sudden and non-sudden accidental occurrences, and subsequent costs incurred by the Department in response to an incident at a structural fill project, even if the applicant or permit holder becomes insolvent or ceases to reside, be incorporated, do business, or maintain assets in the state.

  Closure

  A closure plan is required by NCGS 130A-309.222(b) (1) to be submitted for large structural fill projects. It requires a closure plan to describe the cap system and the methods and procedures used to install the cap system; provide an estimate of the largest area of the structural fill that will require a cap system; provide an estimate of the maximum inventory of coal ash onsite; and provide a schedule for completing closure. In addition, NCGS 130A-309.223 requires specific recordation once closure is complete. The cost to complete closure is calculated in the permit application on a per-acre basis. The average cost for the structural fill final cap varies according to thickness between the top ($172,200 for Brickhaven / $171,300 for Colon Mine) and side slopes ($143,100 for Brickhaven / $143,100 for Colon Mine) for soil, geocomposite drainage layer, and geomembrane cap. Green Meadow LLC and Charah, Inc. used a more conservative approach and chose $172,200 per acre at Brickhaven and $171,300 per acre at Colon Mine. The largest number of estimated acreage requiring the cap liner system for closure at any point in time according to the applications is 34.8 acres at Brickhaven Mine and 31.9 acres at the Colon Mine site. Should construction of any cell increase the open area of the structural fill above the acreage listed in the permit application, the financial assurance for the closure costs would need to be adjusted as appropriate prior to constructing the additional fill areas. Green Meadow LLC and/or Charah, Inc. shall post Financial Assurance for Closure prior to obtaining a Permit to Operate in the amount of:

  Brickhaven Site = $5,992,560 Colon Mine Site = $5,464,470

  Post-Closure

  A Post-Closure Plan is required by NCGS 130A-309.222(b)(2) to be submitted for large structural fill projects. It requires a post-closure plan to describe the monitoring and maintenance activities required for the structural fill project; provide contact information for a person or office responsible for the structural fill project during the post-closure period; describe the

planned uses of the property during the post-closure period; and provide a cost estimate for the post-closure period activities. Large structural fill projects are required by NCGS 130A-309.222(b) to perform post-closure care. In accordance with NCGS 130A-309.222(b), the post-closure care will be conducted for 30 years, unless the DWM permits a decrease in the post-closure care period or requires an increase in the post-closure care period. Post-closure care in 2015 dollars has been estimated at $2,208,000 for Brickhaven and $2,916,000 for Colon Mine Site. Green Meadow LLC, and/or Charah, Inc., shall post Financial Assurance for Post-Closure prior to obtaining a Permit to Operate in the amount of:

Brickhaven Site = $2,208,000 Colon Mine Site = $2,916,000

Maintenance and Monitoring

Post-closure monitoring and maintenance requirements are described in accordance with NCGS 130A-309.222(b)(2). General Site Inspection shall be done on a quarterly basis, which includes the cap system, storm water management system, utilities, leachate collection system, and other miscellaneous inspections. Mowing shall be done at least twice per year or as needed. Water quality monitoring shall be done as per the monitoring plan. Green Meadow LLC and/or Charah, Inc. shall inspect the groundwater monitoring system on a semi-annual basis. Estimated costs for monitoring and maintenance can be found within the post-closure care estimates per site.

Any Corrective Action that the Department may require

Current Corrective Action is not required at this time at either the Brickhaven or Colon Mine Sites.

Brickhaven Site = N/A Colon Mine Site = N/A

Potential Assessment and Corrective Action (PACA) is an estimate established in NCGS 130A-295.2(h) for solid waste management facilities. The purpose of PACA is to provide funds for ensuring that assessment and corrective action activities could be done should the owner not be able to fulfill their obligations under the law. Currently PACA has a minimum requirement of $2,000,000 for sanitary landfills, but the current regulations for this type of activity at structural fills do not provide a minimum value required. Green Meadow LLC and Charah Inc.'s permit application establishes a financial assurance mechanism for PACA in the minimum amount that would be required for a sanitary landfill:

Brickhaven Site = $2,000,000 Colon Mine Site = $2,000,000

Sudden and Non-Sudden accidental occurrences

An owner or operator of a structural fill facility must demonstrate financial responsibility for bodily injury and property damage to third parties caused by sudden and non-sudden accidental occurrences arising from operations of the facility or group of facilities. Owners or operators who combine coverage levels for sudden and non-sudden accidental occurrences must maintain liability coverage in the amount of at least $4 million per occurrence and $8 million annual aggregate.

Brickhaven Site and Colon Mine Site are required to maintain financial responsibility of $4,000,000 per occurrence and $8,000,000 per annual aggregate.

Subsequent costs incurred by the department in response to an incident at a structural fill project

Based on departmental involvement in structural fill related responses, the DWM determined that $65,000 would cover incurred costs by the department in response to an incident at each site:

Brickhaven Site = $65,000 Colon Mine Site = $65,000

Total (2015 Dollars) Financial Assurance to be updated for inflation on an annual basis:

A. Closure, Post-Closure, PACA, Departmental Incurred Costs:
Brickhaven Site = $10,265,560 Colon Mine Site = $10,445,470

B. Sudden and Non-Sudden Accidental Occurrences for all Facilities:
$4 million per occurrence and $8 million annual aggregate

Green Meadow, LLC and/or Charah, Inc. shall post financial assurance for the above items prior to obtaining a structural fill permit. Per the DEMLR permit, Green Meadow LLC and Charah, Inc. shall file a blanket bond of $500,000 covering all mining operations within the state for which the applicant holds a permit. The amount of the bond is based upon the area of affected land to be reclaimed under the approved reclamation plan or plans to which the bond pertains, less any area where reclamation has been completed and released from coverage by the department pursuant to NCGS 74-56. The blanket bond must remain in force for the DEMLR permit to be valid. The total affected land shall not exceed the bonded acreage.

Should Green Meadow LLC or Charah, Inc. become insolvent or cease to do business in the state, the financial assurance mechanisms can be used to perform closure, post-closure, monitoring and maintenance, any corrective action, and respond to bodily injury and property damage to third parties caused by sudden and non-sudden accidental occurrences, and cover costs incurred by the department in response to an incident.

5. Permit Specific Concerns

Comments specific to the permit application, the draft permit and/or its conditions are grouped by issue below with a detailed response for each:

- There were numerous comments received at the hearings and in written form voicing concerns about liners leaking and resulting adverse impact on groundwater and the environment.

Commenters indicate concern on use of just a single 60-mil thick piece of plastic for providing the containment. The required containment provisions comprise a system such that the components all work together to provide the best available control.

The plastic liner is underlain, and in direct contact with, a low permeability soil liner. This can be a two foot thick layer of clay, with a permeability of 1 x 10^{-7} cm/sec (for reference it could take water 50 years to travel through the soil), or a thinner soil layer of 18 inches, with a permeability of 1 x 10^{-5} cm/sec, can be coupled with a geosynthetic clay liner (GCL). The GCL, which is the liner system to be used, has a permeability of 1 x 10^{-9} cm/sec. This bottom liner system sits a minimum of five-feet above the groundwater. Atop the plastic liner is a collection layer to collect water, or leachate, and remove it from the system. Water flows through geonets or sand to pipes where it drains to a sump from where it can be pumped to holding tanks for disposal. The sand or soil layer above the plastic also serves to protect it from operations above.

The coal ash will be placed in layers and compacted in place. The ash itself is very impermeable in this state. In fact, special provisions, such as chimney drains, are made to get the water past this layer and to the bottom so it can be removed. Once the fill is complete it will be encapsulated in another low permeable soil layer, a geomembrane and protected by up to six feet of soil on top.

This arrangement essentially dry-entombs the CCP. The top cap can be monitored, tested and maintained. The leachate collection system will act as a detection system for the presence of water in the system. Another mitigating factor to potential leaks is the short duration of time that the CCP will be open and exposed to the weather. The entire cell will not be built at once. Rather smaller segments will be built, filled and capped, which is essential to control leachate. The opportunity to be exposed to long years of rain fall is diminished, reducing the availability of liquid to become leachate.

Public health and the environment are protected with the best available control technology.

- Also related to liner systems, there were multiple comments about how long liners are designed to last, including the concern that the industry warranty is only for five years.

  The plastic liner is only one part of a system. This system and ones with similar plastic components are used all over the world for containment purposes. Facilities have used this technology to manage municipal solid waste, industrial waste, Subtitle-C hazardous waste, line reservoirs, mineral leach pads, and other uses for decades. How long the plastic liner component can last is unknown, but engineers have approximated its performance through accelerated lab testing. There are many factors that contribute to the longevity of the plastic. Some of the factors include physical damage, degradation by ultra-violet light, effects of chemicals, and effects of elevated temperatures.

  In engineering terms, the life of a plastic liner is defined as that point at which it retains 50% of its original strength properties. That does not mean it instantly disintegrates, fractures or develops holes; it is a benchmark for testing. The reference material indicates an estimated half-life of a HDPE liner is on the order of 449 years at 70 degrees Fahrenheit (20 degrees centigrade).

  The liner system employed in the structural fill permit application is protected from physical damage by protective cover on the top and bottom. This cover also insulates the plastic from the effects of ultraviolet light and large thermal swings. There is no biological activity so the liner

is not subjected to elevated temperatures, but would remain the temperature of the ground, about 64 degrees F (17 degrees C). The fill will not contain organic or petroleum based chemicals, so the plastic would not be affected by them as you may find in other waste management projects. Longevity of the liner technology exceeds that of normal use of concrete. The liner is adequately designed for use to exceed the projected half-life that has been estimated for this product.

- There were numerous comments received at the hearings and in written form voicing concerns that the projects under review are not mine reclamation activities but are landfills. In addition, there were concerns about the end use of the projects once completed not being "beneficial" in nature, as the fills could not sustain future development activities.

  Under the new federal rules the project will be defined as a landfill. The permit application, under current North Carolina statute is for a structural fill, the beneficial use of which is mine reclamation. The project is designed with six feet of soil cover on the top and three on the side slopes. The thickness of soil, combined with the engineered placement of the coal combustion products, make it amendable to development, with proper knowledge and precautions. Structural fills constructed in the state prior to the CAMA Act have end uses such as roads, parking lots, buildings, etc.

- Several commenters remarked that the coal ash will be placed in areas of the mine that have not had product removed yet. There was also comment made that the mine was over five stories tall, implying the structural fill will be at a significant height above the surrounding land.

  The projects will have active mine permits which would allow for continued excavation of the mine for its mineral resources. Some of this mineral could be sold and other resources could be used for the ongoing reclamation of the existing site.

  The application indicates the project will be higher in some areas than the current ground surface but no taller than the highest ground point of the property and will tie in at grade level.

- There were numerous comments received at the hearings and in the written form voicing concerns about the potential (expressed in comments as certainty) that dust could be released from the ash during transportation.

  The North Carolina Department of Transportation implements regulations that do not allow a truck to drive down the road with blowing dust emanating from the transport vehicle. Federal rail regulations would also prohibit that practice.

  Vehicles can be covered, and the material wetted, or sprayed with a matrix to encapsulate the material or even encased in plastic.

  Nationally, ash is routinely moved daily to a variety of facilities including landfills, structural fills, and beneficial use such as cement plants. It is our understanding through the permit application that the majority of the ash will be transported to the mines via rail. This will amount to one or two trains a week, rather than multiple trains a day.

Some ash is expected to arrive via truck, particularly early in the project life. Impacts during that part of the project could be higher than currently exist, but they are temporary in nature and duration.

The ash will be managed at a twenty percent plus moisture content with pads in place to capture spillage. Plans are in place for dust control which the DWM will monitor and refer potential concerns to appropriate agencies.

- There were numerous comments received at the hearings and in the written form voicing concerns about the potential for dust emissions resulting from the placement of ash in the structural fills and resulting operations.

  While it is acknowledged that dust from the improper operations of a coal ash fill project are possible, the Section has observed the placement of ash as structural fill sites (15A NCAC 13B .1700) and permitted landfills across the state where ash, when properly placed can be achieved with little to no dust generation.

  Charah, Inc. as operator of several of the permitted landfills across the state maintains internal standard operating procedures specific to dust control methods. Those same procedures are outlined in Charah Inc.'s recent response to the US Army Corps of Engineers 404 permit comments.

- Several comments were raised about the testing protocol to be used for screening of the pond contents.

  It is acknowledged that there exists more than one type of test to screen coal ash impoundments. This is an evolving discipline and the agency will adjust the screening if it is demonstrated to warrant it. In the federal rulemaking effort, EPA concluded that coal ash in general does not exceed regulatory hazardous waste levels. A lined containment system would be used to manage the material in any event. Therefore, excessive or complex screening procedures would not enhance public health and the environment.

- There were numerous comments received at the hearings and in the written form voicing concerns on adverse water quality contaminants, groundwater contamination, and impacts on water and groundwater in general as it is a drinking water source, due to leachate generated from the structural fill projects.

  Each structural fill facility shall be constructed and operated to ensure groundwater protection in accordance with NCGS 130A.-309.220(b)(4). The structural fills will be constructed with a two- foot compacted clay layer with a permeability of 1×10^{-7} cm/sec overlain by a 60-mil thick geo-membrane liner or equivalent. The bottom of the clay layer is a minimum of five feet above the groundwater table at each location. In addition, a leachate collection system will be constructed on top of the plastic liner to intercept and direct all percolating water to pipes that gravity feed to a sump. From there, it is pumped to leachate collection tanks. During operation of the structural fill, precautions will be taken to divert as much rainwater as possible away from the waste to minimize leachate. Once the fill is complete, it will be encapsulated in another low-

permeability soil layer, a geo-synthetic, and protected by up to six feet of soil on top, thus minimizing the future generation of leachate.

Leachate collected at the structural fills will be sent to a waste water treatment plant (WWTP) to be treated prior to releasing it to waters of the state under a Division of Water Resources NPDES permit. Prior to acceptance of waste, each facility will be required to provide verification to the Section that the WWTP has agreed to accept the leachate. The structural fill project at the Asheville Airport sends its leachate to the Metropolitan Sewerage District, a local WWTP. According to the most recent semi-annual groundwater and leachate monitoring event conducted in November 2014 at the Asheville Airport structural fill, the leachate analytical results were in compliance with the WWTP permits. The coal ash used at the Asheville Airport structural fill and the Brickhaven and Colon structural fills are similar, indicating the leachate concentrations should be similar in nature.

CAMA requires a groundwater monitoring system for the structural fills. This system involves as many groundwater monitoring wells and surface water sampling locations as needed to properly monitor the groundwater and surface water surrounding the fill. Both structural fills have designed a Water Quality Monitoring Plan to satisfy CAMA requirements. Both sites are located within the Triassic Basin. The engineering firm performed a thorough subsurface investigation at both sites in order to understand how to properly monitor any potential groundwater contamination within the complex geology of the Triassic Basin. The Section has performed a thorough technical review of the Water Quality Monitoring Plans at the Brickhaven and Colon structural fills. The Section reviewed the number and location of the proposed groundwater monitoring wells and surface water monitoring locations and the plan was determined to be sufficient in monitoring the groundwater surrounding the fill. The Section may request additional monitoring wells in the future if it is deemed necessary.

- There were specific written comments submitted requesting additional monitoring well locations and monitoring events at each site:

<u>Brickhaven Site</u>

Regarding the comment suggesting the installation of two new groundwater monitoring wells in the SE and SW corners of the fill, there are already monitoring wells at these locations: MW-4 in the SE corner and MW-5 in the SW corner. The Section has performed a thorough review of the groundwater monitoring plan and determined that the number and location of the proposed groundwater monitoring wells are sufficient to monitor the groundwater surrounding the fill.

Specific to the comment suggesting monthly groundwater elevation monitoring to verify the seasonal high groundwater level: the facility is performing nine independent water quality monitoring sampling events (one event prior to waste placement) during the first year of operation at a frequency of every six weeks. During these events, the groundwater elevation in each well will be checked. The Section review indicated that this is an adequate number of monitoring events to verify the seasonal high groundwater level.

Specific to the comment suggesting background sampling to be conducted quarterly for the first year: the facility is conducting nine separate groundwater monitoring events during the first year of operation at all of their compliance groundwater wells and surface water sampling locations. The facility is not required under statute to sample wells not located on their property.

Colon Site

Regarding the comment suggesting the installation of two new groundwater monitoring wells north of PZ-9s and PZ-12: there are two wells in the vicinity of PZ-12 (MW-5 and MW-6). Evaluation of the monitoring plan occurs on an ongoing basis and if a third well is determined to be needed the Section will request the installation of this well before fill operations are in that area. This well does not need to be installed prior to issuing the permit. On paper, a groundwater well at the location north of PZ-9s looks like a good idea. However, based on the topographic contours, this area is not conducive to installing a monitoring well. The terrain is too steep. The Section has performed a thorough review of the groundwater monitoring plan and determined that the number and location of the proposed groundwater monitoring wells are sufficient to monitor the groundwater surrounding the fill.

Specific to the comment suggesting monthly groundwater elevation monitoring to verify the seasonal high groundwater level: the facility is performing nine independent water quality monitoring sampling events (one event prior to waste placement) during the first year of operation at a frequency of every six weeks. During these events, the groundwater elevation in each well will be checked. The Section review determined that this is an adequate number of monitoring events to verify the seasonal high groundwater level.

Specific to the comment suggesting background sampling to be conducting quarterly for the first year: the facility is conducting nine separate groundwater monitoring events during the first year of operation at all of their compliance groundwater wells and surface water locations. The facility is not required under statute to sample wells not located on their property.

Well users who rely on groundwater for consumption are encouraged by the Department of Health and Human Services and DENR to test their wells on a regular basis, regardless of whether there is a known business operation nearby.

- There was a specific written comment submitted suggesting water quality monitoring be performed downstream at both sites and be sampled for aluminum, boron and mercury.

Both the Brickhaven and Colon sites have downstream surface water monitoring locations as part of their Water Quality Monitoring Plan, of which boron and mercury are part of the analytical constituent list that will be sampled semi-annually. Aluminum is not listed on any of the US EPA analytical constituent lists – 40 CFR Part 257 Appendix III, IV, Part 258 Appendix I, II, or Part 264 IX. There are no surface water quality standards for aluminum.

- There was a specific written comment submitted requesting that both attachment 1 and 4 of draft permit # 1910-STRUC-2015 be changed to include provisions for land-use restrictions in accordance with NCGS 143B-279.9.

  Imposing land-use restrictions using NCGS 143B-279.9 is specific to clean-up and remediation activities on properties in order to reduce or eliminate the danger to public health or the environment posed by the presence of contamination at a site. There is no evidence that there will be contamination present at this site justifying the need for land-use restrictions, therefore the use of the statute would be inappropriate at this time. The Division will re-evaluate this over the life of the site and can place land use restrictions at a future date via permit action.

- Several comments were received that requested a delay in permit issuance to allow time for the community to sample ground and surface water in the area so as to establish baselines for future reference.

  The permit action is not preventing the community from sampling ground or surface water. There would be adequate time between permit issuance and the placement of the first loads of coal combustion products in the fills for sampling efforts to be accomplished.

  To learn more about having your private well tested, go to www.TestYourWell.nc.gov , a website provided by the N.C. Department of Health and Human Services. The most important thing private well owners can do to ensure the safety of their drinking water is regular water testing.

- There were specific written comments submitted concerning whether appropriate considerations have been taken as part of the permit process to address issues related to Environmental Justice.

  The agency does not have data to support the hypothesis of an unjust or disproportionate impact. Data available in the EPA tool and the US census show different results for the two counties looking within two miles of the projects. In Chatham County, 14% of the population is non-white and of that proportion 10% is black within two miles of the mine. In Lee County about 38% of the population is non-white and 25% of those are black within two miles of the project. Further examination of demographics, households, income, age and other data do not show results outside the norm for these counties or in relation to the state as a whole.

  Environmental laws are evaluated and designed to be protective of the entire population. The agency believes the design and monitoring and other environmental safeguards are protective of the population in close proximity to the mines.

V. Recommendations

Based on the review of comments received at the public hearing, the comments received during the public comment period, the review of the record for the project, the site visit, and discussions with other DWM staff, the following are recommendations for further consideration:

1. On April 1, 2015, the U.S. Fish and Wildlife Service announced it is protecting the northern long-eared bat as a threatened species under the Endangered Species Act (ESA), primarily due to the

threat posed by white-nose syndrome, a fungal disease that has devastated many bat populations. It was noted in the application documents submitted to the Section that the proposed activity may be required to alter operations to comply with any new regulations that may come from the listing of this bat as endangered.

Therefore, as Green Meadow, LLC and Charah, Inc. indicated in its application, operation plans should be evaluated and any necessary revisions proposed to ensure compliance with the new listing. Any future changes to the site plan and/or the operations to comply with ESA requirements will be subject to permit review and/or modification.

2. During the week of May 18, 2015, coal combustion residuals from the Riverbend Steam Station began to be hauled to Waste Management's permitted landfill in Homer, Georgia. The hauling operations follow the same internal protocols and procedures established for hauling ash to the Asheville Airport. These protocols were also part of Charah Inc.'s proposal to the City of Charlotte regarding possible fill projects at the Charlotte Douglas International Airport and in Charah Inc.'s response to the US Army Corps of Engineers' request for additional information as part of the 404 permit process.

   It is recommended that similar protocols be developed and maintained as part of both the Brickhaven and the Colon Structural on-site operational plans or permit conditions. The coal ash transportation plan should be developed and maintained as part of both the Brickhaven and Colon Structural on-site operational record and should include but not be limited to:

   - Loading, transfer in-route and offloading of coal ash;
   - Monitoring of vehicles along transportation routes (as much as is reasonably possible);
   - Emergency response measures should ash be released during transportation to the fill sites and cleanup standards;
   - Documentation of spills and any supporting documents should be retained as part of the facility's operational record; and
   - Documentation and records should be made available for review and inspection by Section staff upon request.

3. Charah, Inc., as operator of several of the permitted landfills across the state, maintains internal standard operating procedures specific to dust control methods. Those same procedures are outlined in Charah Inc.'s response to the US Army Corps of Engineers 404 permit comments. As NCGS 130A-309.220(a)(9) requires sufficient dust control measures to minimize airborne emissions and prevent dust from becoming a nuisance or safety hazard, it is recommended the same landfill dust control protocols be implemented as part of the structural fill operations, as part of the facility's operational record, along with any supporting documents, and be made available for review and inspection by Section staff upon request.

VI. Summary

Public comments concerning the Division of Waste Management's draft Structural Fill Permits focused on several major issue areas including, but not limited to, quality of life, transportation, construction standards for liners, ground and surface water contamination, Duke Energy's environmental history, property rights, environmental justice, the permitting process, and protection of the water supply in the

Cape Fear River Basin. Due to the number of public comments, many of which expressed concerns on the same issues, comments were grouped, and those with a direct impact on the draft Structural Fill Permit decision-making process were addressed in detail as part of the Comments and Response in Part IV and/or Recommendations in Part V.

Based on the comments received at the public hearing, the comments received during the public comment period, the review of the record for the project, the site visit, and discussions with other DWM staff, I have found no evidence that the proposed structural fill permits violate any of the requirements to receive a permit as allowed under CAMA. Therefore, it is recommended that the permits be issued and subject to the conditions included in my recommendations in Part V. It is also recommended that the division include any additional conditions necessary to ensure that the project will protect public health and the environment as otherwise required under state law.

VII. Attachments

I. Draft Structural Fill Permits
II. Notice of Public Comment period on March 23, 2015
III. Notice of Public Hearings – Chatham News & Sanford Herald, March 26, 2015
IV. April 13, 2015 Non-speaker sign-in sheets (on CD)
V. April 16, 2015 Non-speaker sign-in sheets (on CD)
VI. April 13, 2015 Speaker list (on CD)
VII. April 16, 2015 Speaker list (on CD)
VIII. April 13, 2015 Public Hearing transcript, including oral comments (on CD)
IX. April 16, 2015 Public Hearing transcript, including oral comments (on CD)
X. Written comments received during the comment period, including at the public hearings (on CD)